RESTRICTED

Serial 1101

RADIO FREQUENCY MONITOR

TYPE CWS-60047

PRELIMINARY INSTRUCTIONS

Manufactured for

U. S. NAVY DEPARTMENT—BUREAU OF SHIPS

by

STEWART-WARNER CORPORATION
Chicago, Ill., U. S. A.

Contract NXss-19219

Preliminary
Form 11136

RESTRICTED SERIAL 1101

RADIO FREQUENCY MONITOR

TYPE CWS-60047

INSTRUCTIONS

This instruction book is furnished for the information of commissioned, warrant, enlisted and civilian personnel of the Navy whose duties involve design, instruction, operation and installation of radio and sound equipment. The word "RESTRICTED" as applied to this instruction book signifies that this instruction book is to be read only by the above personnel, and that the contents of it should not be made known to persons not connected with the Navy.

NOTICE

IN SOME CASES IT HAS BEEN FOUND NECESSARY TO MAKE SUBSTITUTIONS OF ORIGINAL MATERIALS. HOWEVER, ALL NECESSARY FACTORS HAVE BEEN MAINTAINED, SO THAT REPLACEMENTS CAN BE MADE, AND WHEREVER SPARE PARTS ARE INVOLVED IN THE SUBSTITUTIONS, THE SPARES ARE IDENTICAL TO THE PARTS MOUNTED IN THE EQUIPMENT. IF IT IS FOUND THAT THE LATTER CANNOT BE MET, SPECIAL INSTRUCTIONS WILL BE ISSUED AND SUPPLIED FOR ALL SHIPMENTS SO AFFECTED.

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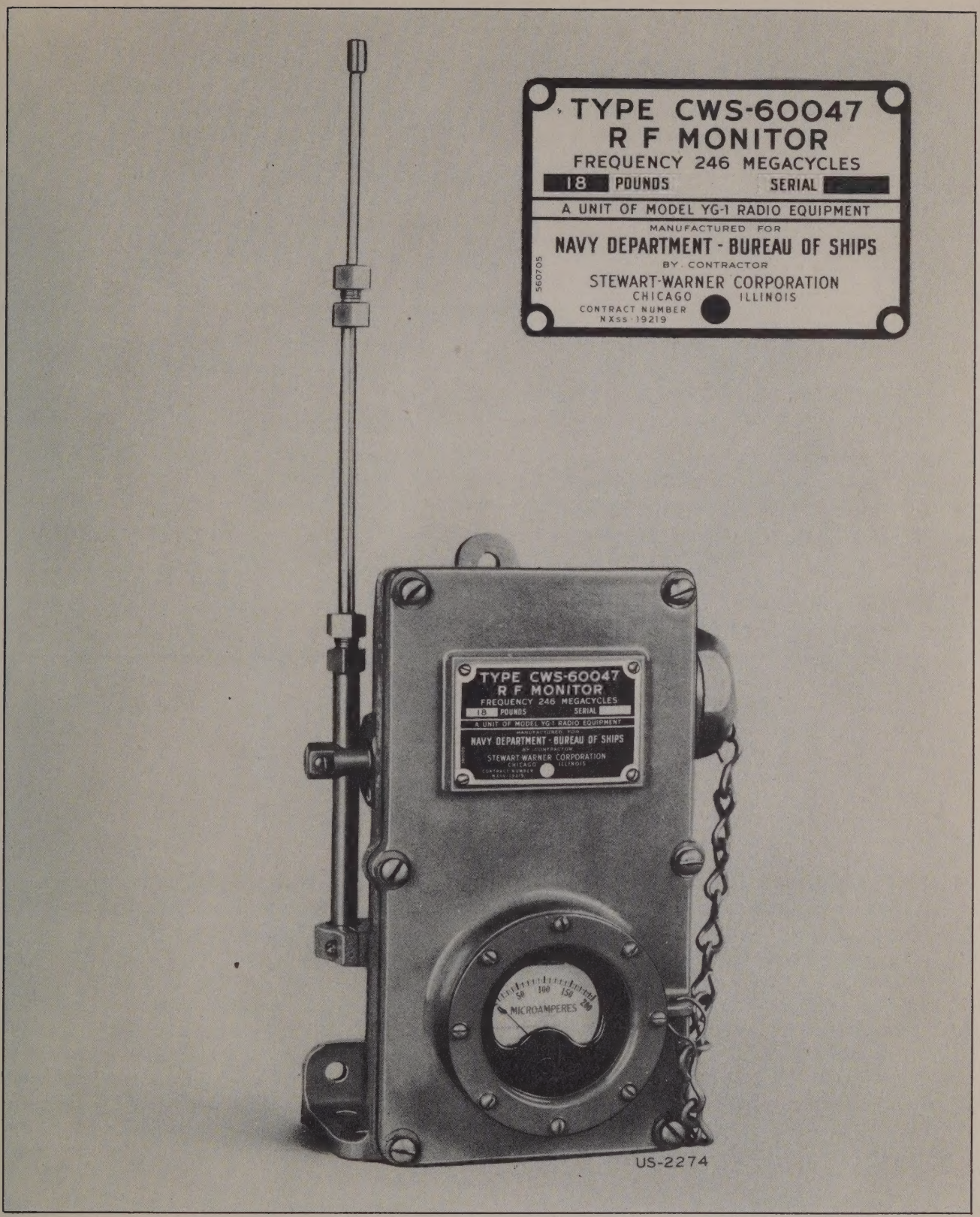

FIGURE 1—TYPE CWS-60047
RADIO FREQUENCY MONITOR

I

INTRODUCTION

1.1 The Type CWS-60047 Radio-Frequency Monitor is designed for use with the Model YG-1 Homing Beacon Equipment to permit monitoring of the radiated signal. This unit is intended to monitor a 246 megacycle signal but may also be tuned for any frequency in the range between 200 and 250 mc. No power is required for its operation.

II

EQUIPMENT

2.1 The CWS-60047 Radio-Frequency Monitor is a single unit, having the following weight and dimensions:

Unit	*Height (inches)*	*Width (inches)*	*Depth (inches)*	*Weight (pounds)*
1 CWS-60047 Radio-Frequency Monitor.....	*	5 15/16	4 5/8	18

* With antenna fully extended: 15 1/8.
With antenna fully retracted: 7 1/4.

III

DESCRIPTION

3.1 This monitor consists essentially of an extended rod antenna, a concentric line, a crystal rectifier and an indicating meter. All components except the antenna are housed in a metal, water-tight case. A view of the complete monitor is shown in Figure 1. Tuning is accomplished by means of a screwdriver slotted shaft, access to which may be obtained by removing the water-tight metal cap, located on the side of the unit. The pickup may be adjusted by varying the length of the telescoping antenna.

3.2 When the monitor is placed within the field of an antenna which is radiating energy within the specified frequency range, a voltage is induced in the frequency monitor antenna. Energy from the antenna is introduced into the concentric line tank by means of the inductor L701 (refer to the schematic diagram, Figure 4). The resonant frequency of the line may be changed by varying the capacitance of the capacitor C702. When the frequency of the resonant line is adjusted to the transmitter frequency, voltage is induced in the pick-up loop L702, and the resulting current in the associated circuit is rectified by the crystal detector E701. The rectified current flows through meter M701. C701 is the r-f by-pass capacitor for the meter M701. This capacitor is built into the structure of the monitor. Two spare crystal rectifiers are contained within the unit.

IV

INSTALLATION

4.1 This unit is designed for mounting on a horizontal surface or against a bulkhead. For horizontal mounting four 5/16 inch bolts are required, for bulk-head mounting, three 5/16 inch bolts are required. Refer to the outline drawing, Figure 5. In general, the unit should be located so that there are no large obstructions between the monitor and the transmitter antenna. The location for each installation will have to be determined by trial, since the presence of standing waves will cause the meter to be inoperative or very insensitive at certain locations. Before the unit is permanently mounted, it is well to make trial tests to determine the best location for it.

V

OPERATION

5.1 Extend the antenna to its full length. Remove the cap over the adjustment for capacitor C702. This cap is located on the side of the frequency monitor (refer to Figure 2). Unscrew the lock-nut so that the slotted shaft can be turned. Rotate the shaft with a medium size screw-driver until the meter (M701) shows a maximum deflection. If the deflection is greater than full scale, retract the antenna until the deflection is approximately 150 microamperes. Should the deflection be small when the antenna is extended full length, then a more suitable location for the monitor should be found. Lock the control (C702) and replace the cap.

NOTE: The sections of the telescopic antenna are locked in position by means of the two lock nuts (refer to Figures 1 and 5). Be sure these nuts have been loosened before the antenna is adjusted.

VI

MAINTENANCE

6.1 This monitor should require little maintenance. In order to insure that the assembly is water-tight, an occasional check on the tightness of the cover screws should be made. When painting near the unit, precautions should be taken to prevent paint from getting on the insulator bushing which supports the input connection. Should the deflection on the meter fall to a small value, check the tuning to be certain that the monitor is tuned to the output frequency. If this does not result in a greater deflection, replace the crystal rectifier unit with a spare. Two spare units are supplied and are located in the lower chamber.

NOTE: When installing a spare crystal, make sure that the inductor L702 is not pushed into contact with the case where it runs through the hole in the compartment separating wall.

6.2 The spacing of the capacitor C703 has been adjusted during test at the factory and should not be changed. Should this adjustment accidentally be disturbed, readjust the capacitor so that there is from 1/8 inch to 5/32 inch spacing between the plates.

6.3 The 0-200 microampere meter, supplied as a spare meter with the Model YG-1 Homing Beacon, may be used to replace the frequency monitor meter, if the latter becomes defective.

TABLE IV

SPARE PARTS LIST BY NAVY TYPE DESIGNATION

FOR MODEL YG-1 R. F. MONITOR UNIT

CONTRACT NXss-19219

ITEM	BOX NO.	QUAN-TITY	NAVY TYPE NUMBER	ALL SYMBOL DESIGNATIONS INVOLVED	DESCRIPTION	NAVY DRAWING OR SPEC.	MFR.	MFR. DESIG.	SPECIAL TOLER-ANCE, RATING OR MODIFICATION	RCA MFG. CO. DRAWING & PART NUMBER
	1	1	-22328	M701	Microammeter, d.c., scale 0-200, metal case, non-glare glass, flush mount-ing, 2-1/2" dia., flange. Same as Frequency Meter (M601) in YG-1 Homing Beacon Equipment Manufactured by Triplett Electric Co. Bluffton, Ohio	17-I-12b	42	Model 0222 T-0-200		M-422603-1

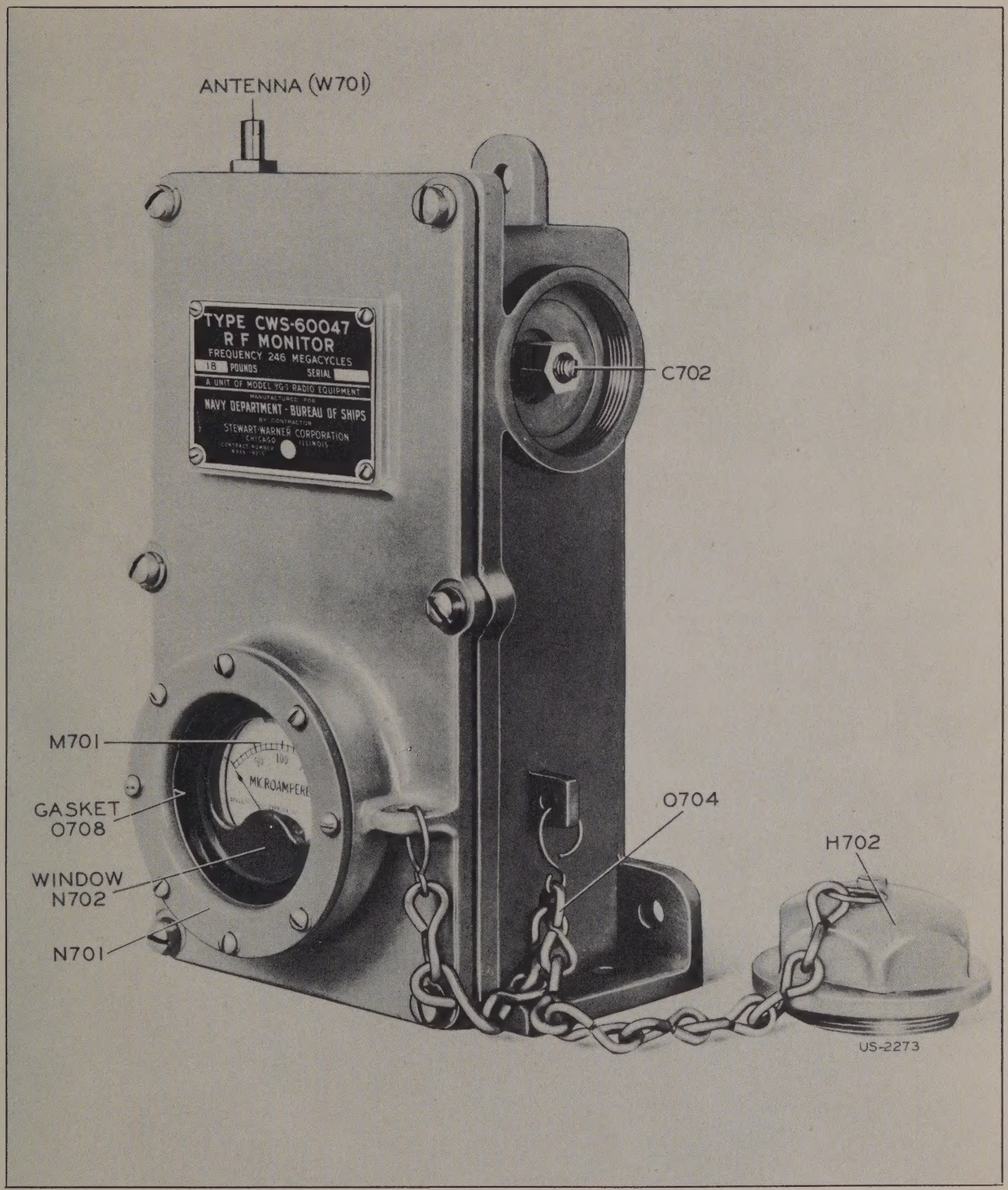

FIGURE 2—MONITOR
(Antenna Retracted, Cap Removed)

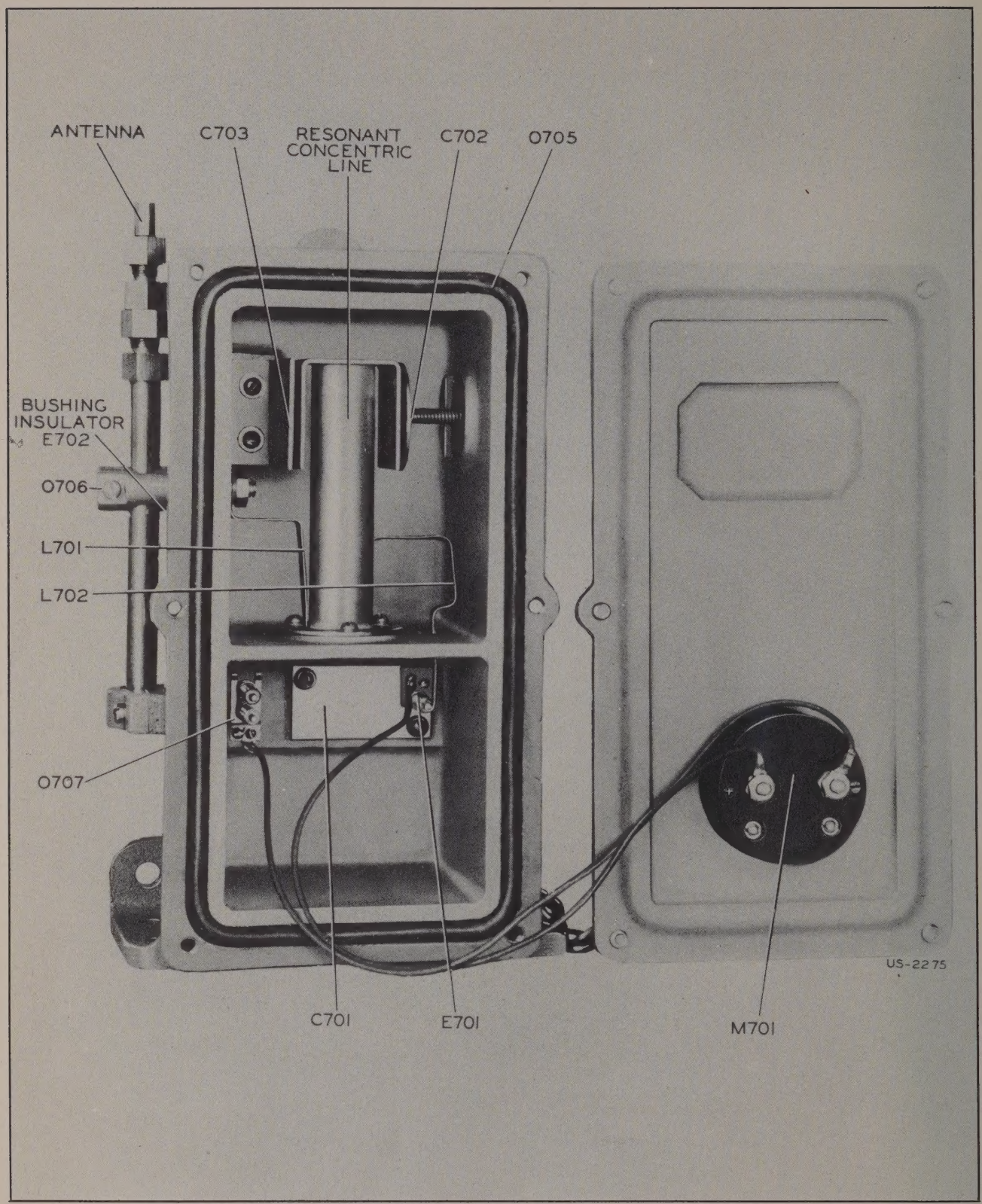

FIGURE 3—MONITOR
(Interior View)

FIGURE 4—MONITOR
(Schematic Diagram, K-876555)

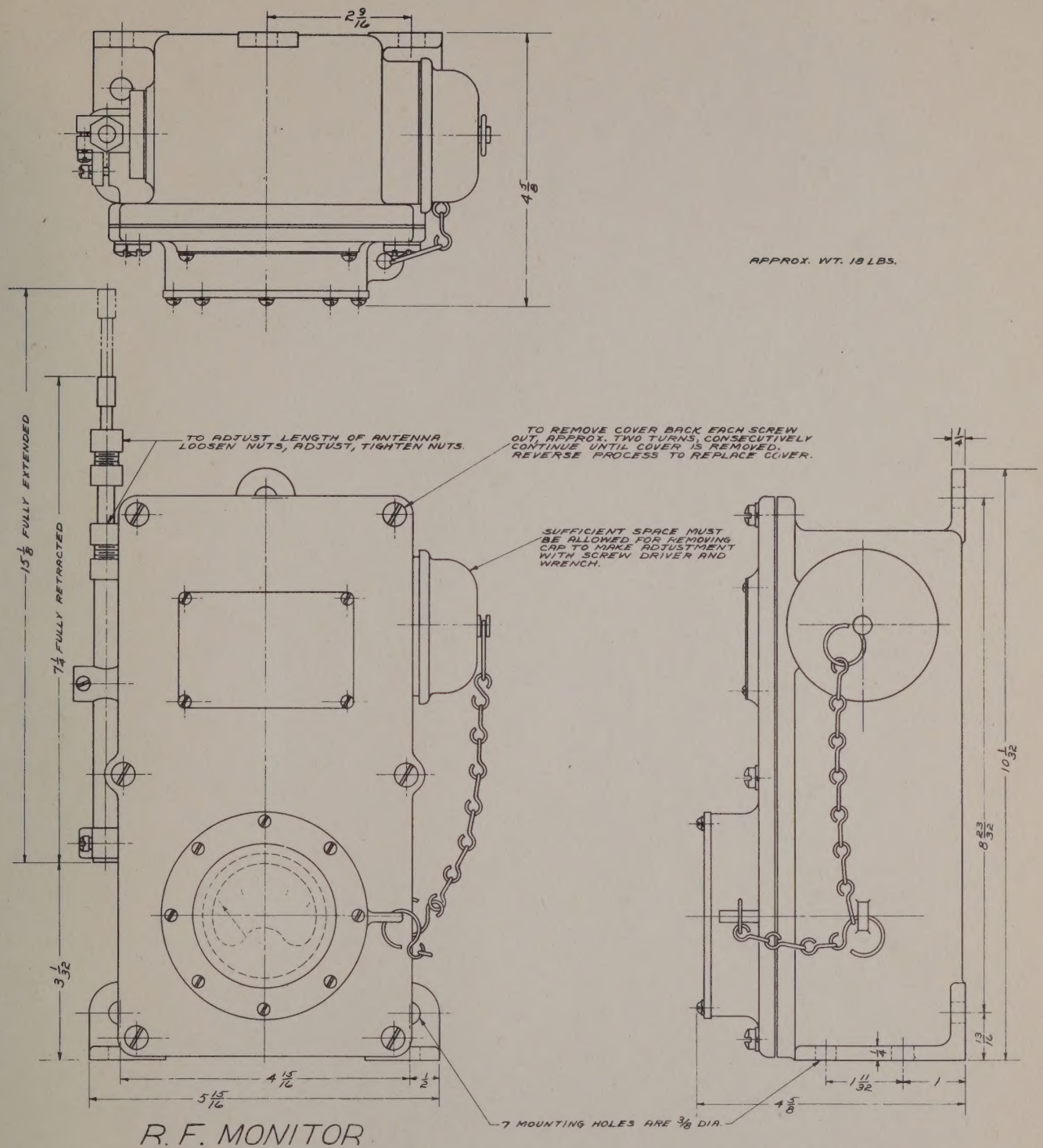
2 9/16
4 5/8
APPROX. WT. 18 LBS.
15 1/8 FULLY EXTENDED
7 1/4 FULLY RETRACTED
3 1/32
TO ADJUST LENGTH OF ANTENNA LOOSEN NUTS, ADJUST, TIGHTEN NUTS.
TO REMOVE COVER BACK EACH SCREW OUT, APPROX. TWO TURNS, CONSECUTIVELY CONTINUE UNTIL COVER IS REMOVED. REVERSE PROCESS TO REPLACE COVER.
SUFFICIENT SPACE MUST BE ALLOWED FOR REMOVING CAP TO MAKE ADJUSTMENT WITH SCREW DRIVER AND WRENCH.
4 15/16
1/2
5 15/16
7 MOUNTING HOLES ARE 3/8 DIA.
1/4
10 1/32
8 23/32
13/16
1 11/32
1
4 5/8
R. F. MONITOR

FIGURE 5—MONITOR
(Outline Drawing, T-621025)